In the Claims:

Amendments to the Claims

1. (Cancelled).

2. (Cancelled).

3. (Cancelled).

4. (Cancelled).

5. (Cancelled).

6. (Cancelled).

7. (Cancelled).

8. (Cancelled).

9. (Cancelled).

10. (Cancelled).

11. (Cancelled).

12. (Cancelled).

13. (Cancelled).

14. (Cancelled).

15. (Cancelled).

16. (Cancelled).

17. (Cancelled).

18. (Withdrawn). A support device for holding microarray substrates in place during microarrayer operation, comprising

- a flat platform on which substrates may be placed, the flat platform including an array surface including first, second, third and fourth peripheral edges;

- a first bar on the first peripheral edge;

- a second bar on the second peripheral edge, the second bar perpendicular to the first bar;

- a third bar on the third peripheral edge, the third bar perpendicular to the second bar and opposed to the first bar, the third bar capable of applying force to the substrates to hold them in place during microarray operation;

- a plurality of end bars perpendicular to the first and third bars and opposed to the second bar, the end bars capable of being located on the third peripheral edge or on the array surface spaced apart from the third peripheral edge, the end bars capable of applying force to the substrates to hold them in place during microarray operation.

19. (Withdrawn). The support device of claim 18, wherein the device may be loaded with substrates for microarray operation by placing the each substrate on the flat platform and sliding it into a position suitable for microarrayer operation.

20. (Withdrawn). The support device of claim 18 or 19, wherein the end bars and second bars are moved proximate to the substrates so that the end bars and second bars apply force to the substrates to hold them in place during microarray operation.

21. (Withdrawn). The support device of any of claims 18 to 20, wherein the substrate comprises a slide.

22. (Withdrawn). The support device of any of claims 18 to 20, wherein the substrate is about the same length as an end bar.

23. (Withdrawn). The support device of claim 22, wherein the substrate and end bar have a length selected from the group consisting of 1 x 3 inch, 1 x 1 inch, and 2 x 3 inch.

24. (Withdrawn). The support device of any of claims 18 to 23, wherein the flat platform comprises a magnetic material and the end bars comprise magnets capable of releasable connection to the flat platform.

25. (Withdrawn). The support device of claim 24, wherein the magnetic material comprises steel.

26. (Withdrawn). The support device of any of claims 18 to 25, wherein the flat platform is rectangular and includes less than 200 micrometre variation between corners.

27. (Withdrawn). The support device of any of claims 18 to 26, wherein the flat platform is about 50 cm in length x 50 cm in width.

28. (Withdrawn). The support device of claim 1, wherein the flat platform is impermeable to air.

29. (Withdrawn). A microarrayer comprising the device of any of claims 18 to 28.

30. (Withdrawn). A blotting device for blotting liquid from the exterior of microarray spotting members, comprising:

- a blotting surface for drawing liquid from the microarray spotting members when the microarray spotting members contact the blotting surface;
- structure for contacting the microarray spotting members with the blotting surface.

31. (Withdrawn). The blotting device of claim 30, wherein the blotting surface comprises glass.

32. (Withdrawn).The blotting device of claim 30, wherein the blotting surface comprises a fixed glass slide.

33. (Withdrawn). The blotting device of any of claims 30 to 32, wherein the spotting members comprise pins.

34. (Withdrawn). The blotting device of claim 33, wherein the pins comprise Telechem Chipmaker 2 pins or Telechem Chipmaker 3 pins, or a combination thereof.

35. (Withdrawn). The blotting device of any of claims 30 to 34, wherein following blotting, the blotting surface is substantially free of liquid from the interior of the microarray spotting members.

36. (Withdrawn). The blotting device of any of claims 30 to 35, further comprising processing system for directing the microarray spotting members to make more than one contact with the blotting surface in a predetermined pattern so that no portion of the blotting surface is contacted by more than one microarray spotting member.

37. (Withdrawn). A microarrayer comprising the blotting system of any of claims 30 to 36.

38. (Withdrawn). A method of delivering liquid from a spotting member onto a microarray substrate for a microarray operation, comprising:

- advancing the spotting member from a first position to a second position, the spotting member spaced apart from the substrate in the first position and the spotting member engaging the substrate in the second position for delivering liquid, the spotting member advancing from the first position to the second position at predetermined, variable velocity, the spotting member velocity reduced when the spotting member approaches the second position from the first position.

- permitting the spotting member to engage the substrate for a pre-determined period of time to allow the liquid to form a spot on the substrate suitable for microarray operation.

39. (Withdrawn). The method of claim 38, wherein the spot is about 200 micrometres or less.

40. (Withdrawn). The method of claim 38, further comprising forming a plurality of spots having a diameter of about 200 micrometres or less wherein the distances between spots are 400 micrometres or less.

41. (Withdrawn). The method of claim 40, capable of forming more than 9200 spots per square centimetre.

42. (Withdrawn). The method of any of claims 38 to 41, wherein the liquid delivered onto the solid substrate comprises DNA.

43. (Withdrawn). A method of drawing liquid from a well into a spotting member for a microarray operation, comprising:

- advancing the spotting member from a first position to a second position, the spotting member spaced apart from the well in the first position and the spotting member proximate to the bottom of the well for drawing liquid in the second position, the spotting member advancing from the first position to the second position at predetermined, variable velocity, the spotting member velocity

reduced when the spotting member approaches the second position from the first position.

- permitting the spotting member to remain proximate to the bottom of the well for a pre-determined period of time to draw the liquid into the spotting member.

44. (Currently amended) A manifold assembly for removing liquid from a plurality of microarray spotting members, the spotting members each having a spotting member body and a first open end portion for printing a spot on a microarray slide, comprising:

a plate, the plate defining a plurality of fluid flow apertures extending through the plate, each aperture located to cooperate with a corresponding spotting member, each [the] aperture having an [axis] axis, [and] a first diameter, an upstream edge forming an inlet and a downstream edge forming an outlet, the edges defining the aperture, the corresponding spotting member [bodies] body having a second diameter wherein the second diameter is greater than the first diameter so that the spotting member may not entirely pass through the aperture, and wherein the first open end portion of the spotting member is adapted to extend into the corresponding aperture to a position where there is space between the spotting member and the aperture; and

turbulence means for creating turbulence in air flowing from the inlet to the outlet in the space between the spotting member and the aperture for removing liquid from the first open end portions of the spotting members [through the apertures].

45. (Currently amended) The assembly of claim 44, wherein the turbulence means comprises i) aligning means for aligning the spotting members proximate to the apertures with each spotting member body extending generally axially away from the corresponding aperture, ii) reciprocating means for repeatedly reciprocating the spotting members generally axially toward and away from the apertures while maintaining the spotting members axially aligned with the corresponding apertures and limiting axially inward travel to provide clearance with the apertures in the limiting position and iii) [a] vacuum means for drawing air around the spotting members to flow from the inlet to the outlet [through the apertures].

46. (Currently amended) The assembly of claim 45, wherein the vacuum means comprises a source of vacuum and a structure for coupling the apertures [plate] to communicate with the source of vacuum to draw air around the spotting members to flow from the inlet to the outlet [liquid from the microarray spotting members through the apertures].

47. (Currently amended) The assembly of claim 44, wherein the apertures comprise channels, [each channel defining an inlet and an outlet in fluid communication] the channels defined by the upstream and downstream edges.

48. (Original) The assembly of claim 47, wherein the apertures are arranged in parallel rows.

49. (Currently amended) The assembly of [claim] claims 44 or 45, wherein the spotting members comprise pins.

50. (Original) The assembly of claim 49, wherein the pins are selected from the group consisting of solid pins and split pins.

51. (Original) The assembly of claim 44, comprising 48 apertures capable of simultaneously removing liquid from 48 spotting members.

52. (Original) The assembly of claim 44, comprising 32 apertures capable of simultaneously removing liquid from 32 spotting members.

53. (Original) The assembly of claim 47, further comprising a cover secured parallel to the plate over the inlets, the cover defining a plurality of cover apertures therethrough, each cover aperture concentric with an inlet of the plate, and the diameter of each cover aperture being less than the diameter of its concentric inlet.

54. (Currently amended) The assembly of [claim] claims 44 or 45, wherein the first open end portion is tapered.

55. (Original) The assembly of claim 54, wherein approximately half of the tapered first open end portion is adapted to extend into the aperture.

56. (Currently amended) The assembly of claim [44 or] 45, wherein the first open end portion comprises a tip and the spotting member is reciprocable by the reciprocating means between first and [second] limiting positions, the tip located outside the aperture in the first position and the tip located inside the aperture in the limiting [second] position.

57. (Currently amended) The assembly of claim [44] 46, wherein the source of vacuum pressure provides a pressure of 50 to 90 psi.

58. (Currently amended) The assembly of claim [44] 46, wherein the source of vacuum pressure provides a pressure of 60 psi.

59. Cancelled

60. (Currently amended) A microarrayer, said microarrayer comprising:

a) a manifold assembly for removing liquid from a plurality of microarray spotting members;

b) a plurality of spotting members each having a spotting member body and a first open end portion for printing a spot on a microarray slide;

c) a plate, the plate defining a plurality of fluid flow apertures extending through the plate, each aperture located to cooperate with a corresponding spotting member, each aperture having an axis, a first diameter, an upstream edge forming an inlet and a downstream edge forming an outlet, the edges defining the aperture, a corresponding spotting member body having a second diameter wherein the second diameter is greater than the first diameter so that the spotting member may not entirely pass through the aperture, and wherein the first open end portion of the spotting member is adapted to extend into the corresponding aperture to a position where there is space between the spotting member and the aperture; and

d) turbulence means for creating turbulence in air flowing from the inlet to the outlet in the space between the spotting member and the aperture for removing liquid from the first open end portions of the spotting members [the manifold assembly of claim 44 or 45].

61. (Currently amended) A method of removing liquid from a plurality of microarray spotting members, comprising [applying a source of vacuum to the assembly of claim 44 or 45 and] creating turbulence in air flowing from the inlet to the outlet of the assembly of claim 44 or

the microarrayer of claim 60 in the space between the spotting member and the aperture for removing liquid from the first open end portions of the spotting members [reciprocating the microarray spotting members proximate to the apertures of the manifold to create air flow and turbulence between the spotting members and the apertures].

62. (Currently amended) The method of claim 61, wherein turbulence is created in air by:

applying a source of vacuum to the spotting members of the assembly to draw air around the spotting members to flow from the inlet to the outlet,

aligning the spotting members proximate to the apertures with each spotting member body extending generally axially away from the corresponding aperture,

repeatedly reciprocating the microarray spotting members generally axially toward and away from the apertures and limiting axially inward travel to provide clearance with the aperture in the limiting position to create turbulence in air flowing from the inlet to the outlet in the space between the spotting member and the aperture for removing liquid from the first open end portions of the spotting members [the spotting members are concentric with the apertures during reciprocation].

63. (Currently amended) The method of claim [61] 62, wherein the spotting members are about 100 micrometers away from the inlet prior to reciprocation.

64. (Currently amended) The method of claim [61] 63, wherein the spotting members are reciprocated about a distance of 1 mm.

65. (Original) The method of claim 61, wherein each spotting member includes a tapered first open end portion adapted to extend into the aperture, the tapered first open end portion received in the aperture during at least part of the reciprocation.

66. (Original) The method of claim 65, wherein the first tapered open end portion reciprocates in and out of the aperture.

67. (Currently amended) The method of claim [61] 65, wherein the tapered first open end portion is spaced apart from the aperture during reciprocation.

68. (Currently amended) A method of removing liquid from a plurality of microarray spotting members, the spotting members each having a spotting member body [having a second diameter] and a first open end portion for printing a spot on a microarray slide, the liquid removed through a [manifold] plate, the plate defining [having] a plurality of fluid flow apertures extending [therethrough] through the plate, each aperture located to cooperate with a corresponding spotting member, [the apertures] each aperture having an axis, [and] a first diameter, an upstream edge forming an inlet and a downstream edge forming an outlet, the edges defining a corresponding aperture, a corresponding spotting member body having a

second diameter, wherein the second diameter is greater than the first diameter so that the spotting member may not entirely pass through the aperture, and wherein the first open end portion of the spotting member is adapted to extend into the corresponding aperture to a position where there is space between the spotting member and the aperture, the method comprising:

first [generally axially] aligning the spotting members proximate to the [manifold] apertures with each spotting member body extending generally axially away from the corresponding apertures] aperture;

[applying a vacuum for] drawing air around the spotting members to flow from the inlet to the outlet [through the apertures]; and

repeatedly reciprocating the spotting members generally toward and away from the corresponding apertures while maintaining the spotting members axially aligned with the corresponding apertures and limiting axially inward travel to provide clearance with the apertures in the limiting position,

wherein turbulence is created in air flowing from the inlet to the outlet in the space between the spotting member and the aperture wall [between the spotting members and

the apertures] for removing liquid from the first open ends of the spotting members through the apertures.

69. (Currently amended) The method of claim 68, wherein the spotting member is reciprocated between first [and second] limiting positions, the tip outside the aperture in the first position and the tip inside the aperture in the limiting [second] position.

70. Cancelled

71. Cancelled

72. Cancelled

73. Cancelled

74. Cancelled

75. Cancelled

76. Cancelled

77. Cancelled

78. Cancelled

79. Cancelled

80. Cancelled

81. Cancelled

82. Cancelled

83. Cancelled

84. Cancelled

85. Cancelled

86. Cancelled

87. Cancelled

88. Cancelled

89. Cancelled

90. (New) The microarrayer of claim 60, wherein the turbulence means comprises i) aligning means for aligning the spotting members proximate to the apertures with each spotting member body extending generally axially away from the corresponding aperture, ii) reciprocating means for repeatedly reciprocating the spotting members generally axially toward and away from the apertures while maintaining the spotting members axially aligned with the corresponding apertures and limiting axially inward travel to provide clearance with the apertures in the limiting position and iii) vacuum means for drawing air around the spotting members to flow from the inlet to the outlet.